

TRANSLATION OF AMENDMENT (NOVEMBER 28, 2005)  
UNDER ARTICLE 34 OF PCT

CLAIMS

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(amended) 1. A semiconductor device comprising:

a semiconductor substrate;

a gate insulator formed on the substrate; and

a gate electrode having a metallic compound film, the  
10 gate electrode being formed on the insulator,

wherein: the metallic compound film in the gate  
electrode is formed by CVD using a material containing a metal  
carbonyl, and at least one of a Si-containing material and a  
N-containing material;

15 the metallic compound film contains the metal in the  
metal carbonyl and at least one of Si and N; and

the work function of the metallic compound film can be  
controlled by changing the content of at least one of Si and N in  
the metallic compound film.

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2. The semiconductor device according to claim 1, wherein  
the metal constituting the metal carbonyl is selected from the  
group consisting of W, Ni, Co, Ru, Mo, Re, Ta, and Ti.

25 3. The semiconductor device according to claim 1, wherein  
the metal carbonyl is  $W(CO)_6$ .

4. The semiconductor device according to claim 1, wherein  
the Si-containing material is selected from the group consisting  
30 of silane, disilane, and dichlorosilane.

5. The semiconductor device according to claim 1, wherein  
the N-containing material is selected from the group consisting  
of ammonia and monomethyl hydrazine.

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(amended) 6. The semiconductor device according to

claim 1, wherein the metallic compound film is formed by using further a C-containing material, and

the metallic compound film contains the metal in the metal carbonyl, at least one of Si and N, and C.

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7. The semiconductor device according to claim 1, wherein the metallic compound film is doped with an *n*-type impurity or a *p*-type impurity.

10 8. The semiconductor device according to claim 1, wherein the gate electrode further comprises a silicon film formed on the metallic compound film.

(amended) 9. The semiconductor device according to  
15 claim 6, wherein the C-containing material is selected from the group consisting of ethylene, allyl alcohol, formic acid, and tetrahydrofuran.

(amended) 10. A semiconductor device comprising:  
20 a semiconductor substrate;  
a gate insulator formed on the substrate; and  
a gate electrode formed on the insulator,  
wherein: the gate electrode comprises: a metallic  
compound film; a barrier layer formed on the metallic  
25 compound film; and a silicon film formed on the barrier layer;  
the barrier layer is formed by the use of a material  
containing a metal carbonyl, a N-containing material, and a  
C-containing material;  
the barrier layer contains the metal in the metal carbonyl,  
30 N, and C;  
the metallic compound film is formed by the use of a  
material containing a metal carbonyl, and at least one of a  
Si-containing material and a N-containing material;  
the metallic compound film contains the metal in the  
35 metal carbonyl and at least one of Si and N; and  
the work function of the metallic compound film can be

controlled by changing the content of at least one of Si and N in the metallic compound film.

11. The semiconductor device according to claim 10, wherein  
5 the metal constituting the metal carbonyl is selected from the group consisting of W, Ni, Co, Ru, Mo, Re, Ta, and Ti.

12. The semiconductor device according to claim 10, wherein  
the metal carbonyl is  $W(CO)_6$ .

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13. The semiconductor device according to claim 10, wherein  
the N-containing material is selected from the group consisting  
of ammonia and monomethyl hydrazine.

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14. The semiconductor device according to claim 10, wherein  
the C-containing material is selected from the group consisting  
of ethylene, allyl alcohol, formic acid, and tetrahydrofuran.